

## **DOPPLER GUIDING CATHETER USING SENSED BLOOD TURBULENCE LEVELS**

### **ABSTRACT**

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A guiding catheter includes a Doppler sensor disposed at a distal end of a flexible shaft. The Doppler sensor can sense a blood flow turbulence level within a chamber of the heart or a blood vessel of the heart. Detecting changes in a blood flow turbulence level is used to assist guiding of the distal end of the flexible shaft.

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The Doppler sensor may include a piezoelectric sensor or an optical sensor. The sensor readings may be processed to show turbulence through a time domain or frequency domain presentation of velocity. The sensor readings can be used to modulate an audible waveform to indicate turbulence. The guiding catheter may further include steering apparatus enabling deflection of the distal tip.